

AUTUMN-WINTER HABITAT USE OF LESSER PRAIRIE-CHICKENS (*TYMPANUCHUS PALLIDICINCTUS*, TETRAONIDAE)

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Key words: *Tympanuchus pallidicinctus*, Lesser Prairie-Chicken, feeding, habitat management, New Mexico, roosting, shinnery oak.

Knowledge of habitat use is necessary for sound management of Lesser Prairie-Chickens. Further, autumn and winter is a critical time because habitat must support prairie-chickens until the next breeding season. Studies in Colorado (Hoffman 1963), Oklahoma (Jones 1963), and Texas (Taylor and Guthery 1980) documented general vegetation types occupied by the species in autumn and winter but provided no specific data on landscape features used by Lesser Prairie-Chickens within these generalized habitats. The purpose of our study was to provide a description of vegetative characteristics at autumn and winter foraging and roosting sites of Lesser Prairie-Chickens in shinnery oak (*Quercus havardii*) grasslands in southeastern New Mexico.

STUDY AREA

The study area is approximately 15,500 ha of Bureau of Land Management lands in Chaves County, southeastern New Mexico. Topography is gently undulating to dune-like, and climate is semiarid with distinct seasons, wide ranges of diurnal and annual temperatures, and moderately low rainfall (Maker et al. 1971). The area is in the Southern Mixed Prairie Type, where the High Plains Bluestem Subtype grades westward into the Desert Prairie Subtype (Holechek et al. 1989:79, Riley et al. 1992).

MATERIALS AND METHODS

We captured eight male Lesser Prairie-Chickens on autumn leks in 1977 with cannon

nets and rocket nets (Smith 1979, Davis et al. 1980). All eight males were radio-tagged and located weekly using a portable receiver and hand-held antenna (Smith 1979, Riley et al. 1992). We also located prairie-chickens by horseback with north-south transects (11 km) established at 0.5-km intervals across the study area (Jan–Feb 1978).

Use sites were identified by numerous tracks and droppings, signs of pecking and scratching, and remains of partly eaten plant material. If sign of more than one bird was present at a site, the sign of a single bird was identified by tracks in the sandy soil. No more than one use site per flock per day was identified and used. We assumed both males and females were present at use sites. At each foraging site we sampled vegetation within 50 m with a 4-arm steppoint transect because foraging did not take place at a specific spot but over a general area (Evans and Love 1957). We used an 8-arm transect at roosting sites because sites were small in size and we believed a 3-m-radius circle would adequately describe the vegetation surrounding the site (Heady et al. 1959).

RESULTS

Prairie-chicken use of the Desert Prairie Subtype was low (0.185 horseback locations and 8.161 radio locations) in comparison to use of the High Plains Bluestem Subtype. Autumn and winter foraging sites were dominated by grasses but included considerable shinnery oak (Table 1). Autumn foraging sites were more grassy and had fewer shrubs than winter sites. Comparisons of basal composition

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TABLE 1. Mean percent basal composition (SD) of vegetation at autumn and winter foraging and roosting sites of Lesser Prairie-Chickens, Chaves County, New Mexico, 1976-75.

Species	Foraging		Roosting (n = 20)
	Autumn (n = 22)	Winter (n = 50)	
GRASSES			
<i>Andropogon hallii</i>	7 (5.9)	7 (7.2)	16 (15.0)
<i>A. scoparius</i>	5 (2.4)	9 (2.5)	5 (2.5)
<i>Sporobolus</i> spp.	10 (3.5)	9 (1.0)	9 (2.3)
<i>Aristida</i> spp.	23 (3.9)	19 (5.1)	16 (9.2)
<i>Bouteloua hirsuta</i>	5 (1.2)	6 (1.6)	9 (2.7)
<i>Panicum hallii</i>	6 (2.6)	5 (1.3)	7 (4.5)
Others ^a	2	3	1
Total	63 (8.7)	59 (5.0)	66 (6.4)
SHRUBS			
<i>Quercus laurardii</i>	32 (10.4)	38 (5.2)	32 (6.1)
Others ^a	5	3	2
Total	37 (9.3)	41 (5.3)	34 (6.4)

^a<0.5% of total composition

from combined autumn and winter roosting sites with those from foraging sites indicated considerable similarity in vegetation. Both foraging and roosting sites showed a dominance of grasses and substantial lesser amounts of shinnery oak. Roosting sites had more grass and less shrub than winter foraging sites. Three-awn grass composition was higher at foraging sites than at roosting sites.

DISCUSSION

Prairie-chickens were found almost entirely in the High Plains Bluestem Subtype in autumn and winter; this preference is similar to that of Lesser Prairie-Chickens in Texas (Taylor and Guthery 1980). Although the sample was small, it appears there was more shinnery oak at foraging sites in winter than in autumn. This change might suggest increased feeding on acorns in winter. The inconsistency of autumn-to-winter changes in composition of grasses might suggest changes were not directly related to prairie-chicken foraging. Changes from autumn to winter in grass composition might have been an artifact of changes in shinnery oak composition. Since percent composition always totals 100%, the increase in one species must be offset by a decrease in one or more other species.

The similarity in vegetation between roosting and foraging sites suggests that prairie-chickens might have roosted and roosted near

their foraging areas; this is in agreement with field observations. Taylor and Guthery (1980) found that mean distances between autumn and winter daily use sites of male prairie-chickens in Texas ranged from 390 to 697 m, but they found that greater distances between use sites were influenced by availability of agricultural crops. More grassy sites were apparently sought for roosting than for foraging. Selection of grassy sites for roosting was expected, considering the need for concealment and the coloration of prairie-chickens. Abundant plants, which grow large enough to provide appreciable concealment cover at roosting sites, include sand bluestem (*Andropogon hallii*), little bluestem (*Schizachyrium scoparium*), drop-seed (*Sporobolus* spp.), three-awn (*Aristida* spp.), hairy grama (*Bouteloua hirsuta*), and shinnery oak.

CONCLUSIONS

Lesser Prairie-Chickens exist in the shrub-dominated High Plains Bluestem Subtype in southeastern New Mexico by using mixed stands of tall grass and shinnery oak. To improve Lesser Prairie-Chicken autumn and winter habitat, we recommend that shinnery oak-tallgrass plant communities be managed by increasing the interspersion of tallgrass and shrub cover types. Lesser Prairie-Chicken foraging habitat can be maintained in semiarid grassland ranges where brush encroachment is not a problem with 25-35% livestock utilization of the annual growth of key forage species (Donart et al. 1978, Holechek et al. 1989). With this recommended use, rangelands of appreciable size will not be grazed uniformly. Some areas around watering points, salt grounds, valley bottoms, and trails will be heavily grazed. Remote pastures away from water, on steep slopes, or with poor accessibility due to physical barriers should receive light grazing pressure.

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